WHAT IS CLAIMED IS:

1. An actuator comprising a resilient shape memory member with superelasticity, a magnetic body, and a magnetic field generator, at least one of said magnetic body and said magnetic field generator being fixed to said resilient shape memory member, such that one of said magnetic body and said magnetic field generator is stationary while the other is movable, whereby said movable member is moved by a magnetic field provided from said magnetic field generator.

2. The actuator according to claim 1, wherein said magnetic body is attached to an end of said resilient shape memory member.

3. The actuator according to claim 1, wherein at least part of said resilient shape memory member is covered with said magnetic body.

4. The actuator according to any one of claims 1 to 3, wherein said resilient shape memory member is a coil spring or a plate spring.

5. An actuator comprising a pair of ring-shaped magnetic bodies, a movable member disposed between said magnetic bodies movably in their axial direction, a magnetic field generator provided in said movable member, a pair of resilient shape memory members each disposed between said movable member and each magnetic body, a frame for supporting said magnetic bodies, and a shaft fixed to said movable member, extending through the center bores of the magnetic bodies and slidably supported by both ends of said frame, said magnetic field generator being energized to generate a magnetic attractive or repulsive force between the magnetic field generator and the magnetic bodies to move the movable member.

6. An actuator comprising a pair of magnetic field generators, a pair of movable members each comprising each magnetic field generator, a magnetic body disposed between said movable members in their moving direction, a resilient shape memory member disposed between said

movable members, a shaft for fixing said magnetic body and slidably supporting said movable members, a frame for fixing said shaft, and output rods fixed to each movable member and slidably supported by said frame, said magnetic field generators being energized to generate a magnetic attractive or repulsive force between said magnetic field generators and said magnetic body to move said movable members.

7. The actuator according to claim 5 or 6, wherein said frame comprises a stopper near said magnetic body to regulate the movable range of said movable member.

8. An actuator comprising a pair of magnetic field generators, a movable member disposed between said magnetic field generators movably in their axial direction, a ring-shaped magnetic body provided in said movable member, a pair of resilient shape memory members each disposed between said movable member and each magnetic field generator, a frame for supporting said magnetic field generators, and a shaft fixed to said movable member and slidably supported by both ends of said frame, said magnetic field generators being energized to generate a magnetic attractive or repulsive force between said magnetic field generators and said magnetic body to move said movable member.

9. The actuator according to claim 8, wherein said frame comprises a stopper near said magnetic field generator to regulate the movable range of said movable member.

10. An actuator comprising a pair of ring-shaped magnetic bodies, a pair of movable members each comprising each magnetic body, a magnetic field generator disposed between said movable members in their moving direction, a pair of resilient shape memory members each disposed between said magnetic field generator and each magnetic body, a frame for supporting said magnetic field generator, and a shaft fixed to each movable

member, extending through a center bore of said magnetic body and slidably supported by an end of said frame, said magnetic field generator being energized to generate a magnetic attractive or repulsive force between said magnetic field generator and said magnetic bodies to move said movable members.

11. An actuator comprising a pair of ring-shaped magnetic bodies, a pair of movable members each comprising each magnetic body, a magnetic field generator disposed between said movable members in their moving direction, a resilient shape memory member disposed between said movable members, a shaft for fixing said magnetic field generator and slidably supporting said movable members, a frame for fixing said shaft, and output rods fixed to each movable member and slidably supported by said frame, said magnetic field generator being energized to generate a magnetic attractive or repulsive force between said magnetic field generator and said magnetic bodies to move said movable members.

12. The actuator according to claim 10 or 11, wherein said frame comprises a stopper to regulate the movable range of said movable member.

13. The actuator according to any one of claims 8 to 12, wherein said movable member comprises a support member for fixing said magnetic body, said support member comprising a large-diameter portion for supporting said magnetic body, a flange on an end of said large-diameter portion, and an external thread portion, onto which a cylindrical nut is screwed, said external thread portion having a groove, into which an end portion of said resilient shape memory member is inserted, said groove having such depth that the end portion of the inserted resilient shape memory member slightly protrudes from said groove of said external thread portion, and the end portion of the inserted resilient shape memory

member being firmly fixed to said support member by screwing said nut onto said external thread portion.

14. The actuator according to any one of claims 8 to 13, wherein said support member is an integrally molded plastic member.

15. The actuator according to any one of claims 8 to 14, wherein said external thread portion and said nut are complementarily tapered.

16. The actuator according to any one of claims 5 to 15, wherein said magnetic body is a permanent magnet.

17. The actuator according to any one of claims 1 to 16, wherein said resilient shape memory member is made of a Ni-Ti alloy.